BOSTON EDISON COMPANY
COST OF SERVICE STUDY
TEST YEAR ENDED DECEMBER 31, 1991

RUN DATE MARCH 4, 1991

*** TIME OF DAY RUNNING COST SUMMARY***

1/ 1/91 TO 12/31/91

	TOTAL COST			MARGINAL COST			
	ENERGY (MWH)	FUEL COST ($000)	AVERAGE ($/MWH)	ENERGY (MWH)	FUEL COST ($000)	AVERAGE ($/MWH)	WEIGHTED ($/MWH)
SUMMER							
PEAK	2208541.	45572.	20.634	557055.	20285.	36.415	38.260
OFFPEAK	2489937.	36913.	14.825	605006.	12502.	20.664	21.572
TOTAL	4698478.	82484.	17.556	1162060.	32787.	28.215	30.972
WINTER							
PEAK	4259096.	77525.	18.202	1065440.	32626.	30.622	31.210
OFFPEAK	4889530.	68776.	14.066	1165400.	23207.	19.913	20.544
TOTAL	9148626.	146301.	15.992	2230840.	55833.	25.028	26.388
TOTAL	13847104.	228786.	16.522	3392900.	88620.	26.119	28.000

000051

MCWS - 650

SCHEDULED MAINTENANCE

UNIT	EQUIVALENT AVAILABILITY FACTOR (NOTE 1)	FORCED OUTAGE RATE (NOTE 1)	SCHEDULED DAYS	SCHEDULED WEEKS
PILGRIM	0.706	0.188	48	6.81
MYSTIC 7	0.792	0.045	62	8.90
NEW BOSTON 1	0.799	0.086	46	6.56
NEW BOSTON 2	0.799	0.086	46	6.56
MYSTIC 4	0.850	0.064	34	4.79
MYSTIC 5	0.708	0.266 (NOTE 2)	13	1.85
MYSTIC 6	0.850	0.107	18	2.51
CONN YANKEE	0.706	0.035	98	13.99
CANAL 1	0.765	0.155	35	4.94
WYMAN 4	0.780	0.120	41	5.93
MILLSTONE 1	0.706	0.061	91	12.94
MILLSTONE 2	0.706	0.046	95	13.55
MILLSTONE 3	0.706	0.109	76	10.83
NEA - BELLINGHAM	0.818	0.132	7	1.00
OCEAN STATE POWER #1	0.818	0.132	14	2.00
OCEAN STATE POWER #2	0.818	0.132	14	2.00
MWRA (NOTE 4)	0.920	0.080	0	
DOWN EAST PEAT (NOTE 4)	0.876	0.124	0	
MDC-WACHUSETT (NOTE 4)	0.920	0.080	0	
JETS				
L STREET	0.754	0.246	0	
MYSTIC 250	0.754	0.246	0	
EDGAR	0.754	0.246	0	
FRAMINGHAM	0.754	0.246	0	
W. MEDWAY	0.754	0.246 (NOTE 3)	0	
M STREET	0.754	0.246	0	

NOTES: (1) BOSTON EDISON ALTERNATIVE GENERATING UNIT PERFORMANCE PROGRAM GOALS FILED WITH THE DPU IN AUGUST 1991
(2) SUMMARY OF 1991 PERFORMANCE AND FUEL EXPENSE DATA (SCHEDULE 14) BY UNIT FOR BOTH THE EQUIVALENT AVAILABILITY FACTOR & THE FORCED OUTAGE RATE
(3) EAF & FOR UNAVAILABLE. UNIT RUN COST SIMILAR TO WEST MEDWAY. WILL USE WEST MEDWAY'S NUMBERS AS AN APPROXIMATION.

THE SCHEDULED MAINTENANCE IS SOLVED FOR SO THAT THE AVAILABILITY IN URSA IS EQUAL TO THE EQUIVALENT AVAILABILITY FACTOR (EAF) FROM THE PERFORMANCE PROGRAM. FOR THE JETS, NO SCHEDULED MAINTENANCE IS ASSUMED SO THAT THE FORCED OUTAGE RATE (FOR) IS EQUAL TO (1 - EAF).

FUEL

NORMALIZED FUEL PRICES FOR YEAR ENDED DECEMBER 31, 1991
(NOTE 1)

UNIT	FUEL EXPENSE	MWH	$/MWH
MYSTIC 4	$3,686,780	135,632	$27.18
MYSTIC 5	$7,302,850	275,743	$26.48
MYSTIC 6	$8,133,070	251,521	$32.34
MYSTIC 7	$54,049,360	2,172,669	$24.88
NEW BOSTON 1	$45,178,070	2,014,420	$22.43
NEW BOSTON 2	$38,754,670	1,568,625	$24.71
WYMAN 4	$1,558,120	64,753	$24.06
PILGRIM	$23,365,246	4,081,616	$5.72
EDGAR	$116,250	1,385	$83.94
FRAMINGHAM	$170,750	1,955	$87.34
L ST	$77,180	914	$84.44
M ST	$110,004	1,364	$80.65
MYSTIC 250	$57,710	683	$84.49
W MEDWAY	$745,630	10,530	$70.81
CANAL	$14,045,180	635,133	$22.11
CONN YANKEE	$2,759,768	313,185	$8.81
MILLSTONE 1	$1,861,295	182,879	$10.18
MILLSTONE 2	$1,572,113	182,772	$8.60
MILLSTONE 3	$1,545,825	365,874	$4.23
NEA - BELLINGHAM	$110,592,416	1,698,764	$65.10
OCEAN STATE POWER #1	$9,608,444	533,177	$18.02
OCEAN STATE POWER #2	$8,318,638	419,690	$19.82
MWRA SOUTHBORO	$207,530	3,751	$55.33
MDC WACHUSETTS	$111,960	3,650	$30.67
DOWN EAST PEAT	$15,208,050	189,140	$80.41

NOTES: (1) NORMALIZED FUEL ANALYSIS

NORMALIZED UNIT CAPACITY RATINGS FOR RATE YEAR NOVEMBER 1, 1992
TO OCTOBER 31, 1993 (NOTE 1)

UNIT	SUMMER NORMAL (MW)	WINTER NORMAL (MW)	MUST RUN (MW)	
MYSTIC 4	133.40	135.00	20.00	
MYSTIC 5	135.00	135.00	20.00	
MYSTIC 6	135.90	138.28		
MYSTIC 7	565.00	562.61	99.72	
NEW BOSTON 1	350.00	350.00	200.00	
NEW BOSTON 2	350.00	350.00	170.00	
PILGRIM	492.25	497.01	298.20	
EDGAR JET 1	9.45	12.00		
EDGAR JET 2	7.25	12.00		
EDGAR JETS (COMB)	16.70	24.00		
FRAMINGHAM JET 1	8.90	12.00		
FRAMINGHAM JET 2	8.50	12.00		
FRAMINGHAM JET 3	8.60	12.00		
FRAMINGHAM JETS (COMB)	26.00	36.00		
L STREET JET	15.10	20.00		
WEST MEDWAY JET 1	36.10	57.80		
WEST MEDWAY JET 2	41.60	55.90		
WEST MEDWAY JET 3	37.20	59.40		
WEST MEDWAY JETS (COMB)	114.90	173.10		
MYSTIC 250 JET	8.50	12.00		
CONN YANKEE	53.68	56.10	33.69	
CANAL 1	141.50	142.25	50.00	
WYMAN 4	36.18	36.46		
M STREET JET	21.00	33.95		
MILLSTONE 1	29.66	30.00	17.93	(NOTE 2)
MILLSTONE 2	30.03	30.00	18.01	(NOTE 2)
MILLSTONE 3	59.01	59.48	35.59	(NOTE 5)
NORTHFIELD 1 - 4	180.00	180.00		(NOTE 2)
PEAT PRODUCTS	23.00	23.70		
OSP #1	57.58	66.74		(NOTE 2)
NEA-BELLINGHAM	209.18	253.74		(NOTE 2)
OSP #2	52.41	62.98		(NOTE 2)
TOTAL	3,235.98	3,408.40	963.14	

UNITS NOT USED IN POD DISPATCH

MASS YANKEE	16.14	16.44	9.86	(NOTE 5)
PT LEPREAU	100.00	100.00	60.00	(NOTE 3)
MIDDLETOWN 2	19.24	19.24		(NOTE 3)
MIDDLETOWN 3	38.32	38.32		(NOTE 3)
MIDDLETOWN 4	65.79	65.79		(NOTE 3)
MONTVILLE 5	20.58	20.58		(NOTE 3)
MONTVILLE 6	102.13	102.13		(NOTE 3)
NEW HAVEN HARBOR	82.00	82.00		(NOTE 4)
TOTAL	444.21	444.51	69.86	

NOTES: (1) SOURCE OF UNIT CAPACITY RATINGS FOR YEAR ENDING DECEMBER 31, 1991 IS NEPOOL BILLING DATA
(2) THE NORMAL MW RATINGS REPRESENT THE DECEMBER 1991 UNIT CAPACITY
(3) WILL NOT BE USED IN POD DISPATCH. CONTRACTS EXPIRED OCTOBER 31, 1991
(4) WILL NOT BE USED IN POD DISPATCH. CONTRACT EXPIRES OCTOBER 31, 1992
(5) DOES NOT REFLECT 1991 UNIT CAPACITY RATING. REFLECTS EXPECTED UNIT CAPACITY RATING FOR RATE YEAR BEGINNING NOVEMBER 1, 1992
(6) WILL NOT BE USED IN POD DISPATCH. PLANT CLOSED PERMANENTLY.

COMPUTATION OF CAPITAL COST BY UNIT

	(1) PLANT IN SERVICE (NOTE 1)	(2) ACCUMULATED DEPRECIATION (NOTE 2)	(3) O&M EXCEPT FUEL (NOTE 1)	(4) DEPRECIATION EXPENSE (NOTE 2)	(5) CAPITAL COST (*=SPLIT BY MW) (NOTE 3)
NEW BOST UNIT 1	$112,660,555	$50,755,842	$9,279,764	$4,268,430	$24,090,567 *
MUST RUN 200MW					$13,766,038
EXCESS 150MW					$10,324,529
NEW BOST UNIT 2	$112,660,555	$50,283,177	$9,279,764	$3,838,767	$23,741,398 *
MUST RUN 170MW					$11,531,536
EXCESS 180MW					$12,209,862
MYSTIC 4	$71,926,306	$34,176,786	$6,533,099	$2,334,506	$15,296,348 *
MUST RUN 20MW					$2,266,126
EXCESS 105MW					$13,030,222
MYSTIC 5	$71,926,306	$32,661,566	$6,533,099	$2,323,017	$15,542,901 *
MUST RUN 20MW					$2,302,652
EXCESS 115MW					$13,240,249
MYSTIC 6	$75,229,588	$30,803,468	$6,833,138	$2,374,452	$16,773,358
MYSTIC 7	$215,517,337	$64,593,521	$12,532,725	$9,418,850	$47,653,901 *
MUST RUN 99.72 MW					$8,438,932
EXCESS 463.39 MW					$39,214,969
WYMAN 4	$12,117,745	$5,469,771	$789,562	$431,180	$2,352,892
L STREET	$2,447,966	$1,393,737	$96,139	$113,661	$389,335
EDGAR	$5,720,584	$2,068,436	$203,300	$223,044	$1,048,305
MYSTIC 250	$2,061,017	$948,149	$17,746	$88,358	$295,625
FRAMINGHAM	$6,107,707	$3,025,997	$385,042	$278,818	$1,188,675
WEST MEDWAY	$23,407,302	$11,062,658	$1,687,816	$1,084,482	$4,874,591
PILGRIM	$1,054,361,082	$313,713,752	$87,969,592	$38,093,305	$252,195,137 *
MUST RUN 298.2 MW					$151,314,038
EXCESS 198.81 MW					$100,881,099
	$1,766,144,049	$600,956,860	$142,140,786	$64,870,870	

NOTES: (1) MCWS-661
(2) MCWS-662
(3) ROR * [(1)-(2)] + (3) + (4)

COMPUTATION OF O&M AND PLANT IN SERVICE BY UNIT

	(1) TOTAL PROD EXP	(2) FUEL	(3) O&M EXCPT FUEL (* SPLIT BY MW) COL. (1)-(2)
NEW BOST	$103,768,928	$85,209,401	$18,559,527 *
UNIT 1 350 MW			$9,279,764
UNIT 2 350 MW			$9,279,764
L STREET (RET)	$0	$0	$0
MYSTIC 200	$48,522,746	$28,623,409	$19,899,337 *
MYSTIC 4 135MW			$6,533,099
MYSTIC 5 135MW			$6,533,099
MYSTIC 6 141.2MW			$6,833,138
MYSTIC 7	$77,937,223	$65,404,498	$12,532,725
WYMAN 4	$1,942,811	$1,153,249	$789,562
L STREET	$186,729	$90,590	$96,139
EDGAR	$277,198	$73,898	$203,300
MYSTIC 250	$60,011	$42,265	$17,746
FRAMINGHAM	$500,040	$114,998	$385,042
WEST MEDWAY	$2,494,757	$806,941	$1,687,816
EDGAR (RET)	$0	$0	$0
PILGRIM	$107,838,017	$19,868,425	$87,969,592

	(1) MW	(2) LAND & RIGHTS	(3) REALLOCATED LAND & RIGHTS WGTD BY MW-NOTE	(4) STRUCTURES	(5) EQUIPMENT	(6) TOTAL (*=SPLIT BY MW) (3)+(4)+(5)
NEW BOSTON	700	$721,485	$968,625	$23,564,363	$200,788,121	$225,321,109 *
UNIT 1 350MW						$112,660,555
UNIT 2 350MW						$112,660,555
L STREET (RET)		$274,815	$0	$3,915,607	$5,820,482	$9,736,089
MYSTIC 200	411.2	$7,097,010	$2,953,138	$33,222,275	$182,906,787	$219,082,200 *
MYSTIC 4 135MW						$71,926,306
MYSTIC 5 135MW						$71,926,306
MYSTIC 6 141.2MW						$75,229,588
MYSTIC 7	565	$0	$4,057,691	$25,032,302	$186,427,344	$215,517,337
WYMAN 4		$33,106	$33,106	$1,687,959	$10,396,680	$12,117,745
L STREET	20	$0	$27,675	$208,402	$2,211,889	$2,447,966
EDGAR		$0	$199,179	$307,988	$5,213,417	$5,720,584
MYSTIC 250	12	$0	$86,181	$230,010	$1,744,826	$2,061,017
FRAMINGHAM		$0	$0	$633,481	$5,474,226	$6,107,707
WEST MEDWAY		$37,344	$37,344	$1,226,693	$22,143,265	$23,407,302
EDGAR (RET)		$199,179	$0	$3,370,617	$7,035,546	$10,406,163
PILGRIM		$6,707,428	$6,707,428	$201,157,101	$846,496,553	$1,054,361,082
TOTALS		$15,070,367	$15,070,367	$294,556,798	$1,476,659,136	
COLUMNS (3) + (4) + (5)					$1,786,286,301	

SOURCE: FERC FORM 1, PAGES 402-3
NOTE 1: EDGAR (RETIRED) TO EDGAR JET
L ST (RETIRED) TO L ST JET & NEW BOSTON
MYSTIC 200 TO MYSTIC 200,7,250

TO: MS. T. BERGERON FROM: MR. F. HOEY MARCH 6, 1992

THE 1991 DEPRECIATION EXPENSE AND RESERVE INFORMATION WHICH YOU REQUESTED IS AS FOLLOWS. PLEASE NOTE THAT THESE FIGURES ARE BASED ON ALLOCATIONS. THE COMPANY DOES NOT MAINTAIN SPECIFIC DEPRECIATION EXPENSE OR DEPRECIATION RESERVE DATA FOR ITS GENERATING UNITS.

PLANT	1991 DEPRECIATION EXPENSE ($)	1991 DEPRECIATION RESERVE
MYSTIC 4	2,334,506	34,176,786
MYSTIC 5	2,323,017	32,661,566
MYSTIC 6	2,374,452	30,803,468
MYSTIC 7	9,418,850	64,593,521
NEW BOSTON 1	4,268,430	50,755,842
NEW BOSTON 2	3,838,767	50,283,177
WYMAN 4	431,180	5,469,771
TOTAL FOSSIL	24,989,203	268,744,131
NUCLEAR	38,093,305	313,713,752
75 JET	223,044	2,068,436
250 JET	88,358	948,149
4 JET	113,661	1,393,737
240 JET	278,818	3,025,997
446 JET	1,084,482	11,062,658
TOTAL JET	1,788,363	18,498,977
TOTAL PRODUCTION	64,870,871	600,956,860

Fred

ACC555

ACCOUNT 555 DEMAND CHARGE (NOTE 1)

	CANAL	$10,017,019		
	CONN YANKEE	$17,662,271		
	M STREET	$1,934,100		
	MWRA	$0		
	MDC-WACHUSETT	$0		
	PP&L	$1,319,348		
	NEA - BELLINGHAM	$0		
	MILLSTONE 1	$5,396,444	(NOTE 2)	
	MILLSTONE 2	$5,649,552	(NOTE 2)	
	MILLSTONE 3	$29,222,914	(NOTE 2)	
(NOTE 4)	OCEAN STATE #1	$36,237,246	---------->	$20,374,652
(NOTE 4)	OCEAN STATE #2	$3,158,796	---------->	$19,021,390

COMPUTATION OF PRETAX RATE OF RETURN (NOTE 3)

(1) TAXES OTHER THAN INCOME TAXES	$85,250
(2) MASSACHUSETTS FRANCHISE TAX	$84,997
(3) FEDERAL INCOME TAX ALLOWANCE	
(4) TAX CREDITS	($4,290)
(5) UNIFORM RETURN	$243,904
(6) TOTAL (1) THROUGH (5)	$409,861
(7) NET ELECTRIC PLANT	$2,407,300
(8) PRETAX RATE OF RETURN (6)/(7)	17.03%

NOTES: (1) FERC FORM 1, PAGE 326-7
(2) FERC FORM 1, PAGE 326-7 (BROKEN DOWN INDIVIDUALLY BY WHOLESALE CONTRACT MGMT)
(3) EMBEDDED COST OF SERVICE STUDY (AS OF 03/18/92)
(4) REALLOCATED BASED ON 1992 MW DUE TO SIGNIFICANT CHANGE FROM 1991 OUTPUT

COMPUTATION OF MARGINAL METER AND SERVICE INVESTMENT

	(1) 1991 DOLLARS	(2) 1991 DOLLARS	(3) 1992 DOLLARS	(4) 1992 DOLLARS
RATE	TYPICAL METER PER CUSTOMER (NOTE 1)	SERVICE INVESTMENT PER CUSTOMER (NOTE 2)	TYPICAL METER PER CUSTOMER (NOTE 3)	SERVICE INVESTMENT PER CUSTOMER
R1/R2	$56.93	$103.40	$59.89	$108.78
R4	$300.00	$96.00	$315.60	$100.99
G1/018/078	$183.00	$118.81	$192.52	$124.99
G1/OTHER	$63.04	$110.47	$66.32	$116.21
T1	$300.00	$96.00	$315.60	$100.99
G2	$221.94	$114.80	$233.48	$120.77
T2	$2,674.47	$117.64	$2,813.54	$123.76
G3	$4,481.35	$0.00	$4,714.38	$0.00
S2	$55.00	$0.00	$57.86	$0.00

NOTES:
(1) MCWS-702, PAGES 3 AND 4.
(2) MCWS-702, PAGES 1 AND 2.
(3) DRI UTILITY COST FORECASTING INDEX FOR WAGE RATE-MCWS 1040.
ESCALATOR = 1.052

SERVICES - ACCOUNT 369

RATE	REVENUE CODE	(1) COST OF AVERAGE LENGTH	(2) AVG YR END # OF CUSTOMERS	(3) SERVICES COST	(4) DOLLARS PER CUSTOMER
R1	020 RADIAL	$96	442,937	$42,521,952	
	020 NETWORK	$186	36,007	$6,697,302	
	021 RADIAL	$96	30,299	$2,908,704	
	021 NETWORK	$186	718	$133,548	
	110 RADIAL	$96	710	$68,160	
	110 NETWORK	$186	47	$8,742	
	SUBTOTAL		510,718	$52,338,408	
R1	022	$96	24,857	$2,386,272	
	022 NETWORK	$186	4,850	$902,100	
	023	$96	8,787	$843,552	
	023 NETWORK	$186	3,520	$654,720	
	SUBTOTAL		42,014	$4,786,644	
R2	030,031,032,033	$96	5,845	$561,120	
	030,031,032,033 NETWORK	$186	854	$158,844	
	SUBTOTAL		6,699	$719,964	
	TOTAL R1/R2		559,431	$57,845,016	$103.40
R4	224,225	$96	98	$9,408	
	226	$96	20	$1,920	
	TOTAL R4		118	$11,328	$96.00
	TOTAL RESIDENTIAL		559,549	$57,856,344	$103.40
G1	011 RADIAL	$96	38,861	$3,730,656	
	011 NETWORK	$186	7,620	$1,417,320	
	013 RADIAL	$96	30	$2,880	
	013 NETWORK	$186	14	$2,604	
	016 RADIAL	$96	1,422	$136,512	
	016 NETWORK	$186	9	$1,674	
	191 RADIAL	$96	89	$8,544	
	191 NETWORK	$186	77	$14,322	
	193 RADIAL	$96	651	$62,496	
	193 NETWORK	$186	146	$27,156	
	SUBTOTAL		48,919	$5,404,164	$110.47
	018 RADIAL	$96	5,103	$489,888	
	018 NETWORK	$186	1,753	$326,058	
	078 RADIAL	$96	92	$8,832	
	078 NETWORK	$186	11	$2,046	
	SUBTOTAL		6,959	$826,824	$118.81
	TOTAL G1		55,878	$6,230,988	$111.51
T1	217	$96	1	$96	
	TOTAL T1		1	$96	$96.00
	TOTAL G1/T1		55,879	$6,231,084	$111.51
G2	019 RADIAL	$96	17,120	$1,643,520	
	019 NETWORK	$186	4,773	$887,778	
	079 RADIAL	$96	1,103	$105,888	
	079 NETWORK	$186	54	$10,044	
	091 RADIAL	$96	230	$22,080	
	091 NETWORK	$186	72	$13,392	
	093 RADIAL	$96	1,240	$119,040	
	093 NETWORK	$186	454	$84,444	

SERVICES - ACCOUNT 369

RATE	REVENUE CODE	(1) COST OF AVERAGE LENGTH	(2) AVG YR END # OF CUSTOMERS	(3) SERVICES COST	(4) DOLLARS PER CUSTOMER
	112	$96	36	$3,456	
	113	$96	1	$96	
	130 RADIAL	$96	73	$7,008	
	130 NETWORK	$186	1	$186	
	214	$96	25	$2,400	
	234	$96	7	$672	
	274	$96	10	$960	
	314	$96	23	$2,208	
	374	$96	3	$288	
	430 RADIAL	$96	423	$40,608	
	430 NETWORK	$186	22	$4,092	
	593	$96	3	$288	
	599 RADIAL	$96	22	$2,112	
	599 NETWORK	$186	3	$558	
	SUBTOTAL G2		25,698	$2,951,118	
G2	264	$96	51	$4,896	
	267	$96	4	$384	
	268	$96	3	$288	
	SUBTOTAL G2		58	$5,568	
	TOTAL G2		25,756	$2,956,686	$114.80
T2	617	$96	46	$4,416	
	627	$96	5	$480	
	677	$96	17	$1,632	
	707	$96	17	$1,632	
	717	$96	13	$1,248	
	777	$96	1	$96	
	907 RADIAL	$96	50	$4,800	
	907 NETWORK	$186	6	$1,116	
	917 RADIAL	$96	798	$76,608	
	917 NETWORK	$186	346	$64,356	
	977 RADIAL	$96	143	$13,728	
	977 NETWORK	$186	4	$744	
	SUBTOTAL T2		1,446	$170,112	$117.64
	TOTAL RATE G2/T2		27,202	$3,126,798	$114.95
	TOTAL ELECTRIC EXCLUDING G-3 & STREET LIGHTING		642,630	$67,214,226	$104.59

NOTE: RETAIL COST OF SERVICE STUDY FOR THE YEAR ENDING 12/31/91.

METERS - ACCOUNT 370

RATE	REVENUE CODE	(1) TOTAL INSTALLED COST	(2) AVG YR END # OF CUSTOMERS	(3) METERING COST	(4) DOLLARS PER CUSTOMER
R1	020 RADIAL	$55	442,937	$24,361,535	
	020 NETWORK	$85	36,007	$3,060,595	
	021	$55	31,017	$1,705,935	
	110	$55	757	$41,635	
	SUBTOTAL		510,718	29,169,700	
R1	022	$55	29,707	$1,633,885	
	023	$55	12,307	$676,885	
	SUBTOTAL		42,014	$2,310,770	
R2	030,031,032,033	$55	6,699	$368,445	
	SUBTOTAL		6,699	368,445	
	TOTAL R1/R2		559,431	$31,848,915	$56.93
R4	224,225	$300	98	$29,400	
	226	$300	20	$6,000	
	TOTAL R4		118	$35,400	$300.00
	TOTAL RESIDENTIAL		559,549	$31,884,315	$56.98
G1	011 RADIAL	$55	38,861	$2,137,355	
	011 NETWORK	$85	7,620	$647,700	
	013 RADIAL	$55	30	$1,650	
	013 NETWORK	$85	14	$1,190	
	016	$55	1,431	$78,705	
	191	$142	166	$23,572	
	193	$243	797	$193,671	
	SUBTOTAL		48,919	$3,083,843	$63.04
	018	$183	6,856	$1,254,648	
	078	$183	103	$18,849	
	SUBTOTAL		6,959	$1,273,497	$183.00
	TOTAL G1		55,878	$4,357,340	$77.98
T1	217	$300	1	$300	
	TOTAL T1		1	$300	$300.00
	TOTAL G1/T1		55,879	$4,357,640	$77.98
G2	019 <50KW	$183	18,884	$3,455,772	
	019 51-200KW	$243	2,874	$698,382	
	019 >200KW	$1,430	135	$193,050	
	079 <50KW	$183	748	$136,884	
	079 51-200KW	$243	389	$94,527	
	079 >200KW	$1,430	20	$28,600	
	091 <50KW	$183	276	$50,508	
	091 51-200KW	$243	26	$6,318	
	091 >200KW	$1,607	0	$0	
	093 <50KW	$183	1,484	$271,572	
	093 51-200KW	$243	192	$46,656	
	093 >200KW	$1,607	18	$28,926	

METERS - ACCOUNT 370

RATE	REVENUE CODE	(1) TOTAL INSTALLED COST	(2) AVG YR END # OF CUSTOMERS	(3) METERING COST	(4) DOLLARS PER CUSTOMER
	112	$464	36	$16,704	
	113	$3,747	1	$3,747	
	130	$703	74	$52,022	
	214	$3,747	25	$93,675	
	234	$3,747	7	$26,229	
	274	$3,747	10	$37,470	
	314	$3,747	23	$86,181	
	374	$3,747	3	$11,241	
	430	$703	445	$312,835	
	593	$999	3	$2,997	
	599	$142	25	$3,550	
	SUBTOTAL G2		25,698	$5,657,846	
G2	264	$738	51	$37,638	
	267	$2,964	4	$11,856	
	268	$2,964	3	$8,892	
	SUBTOTAL G2		58	$58,386	
	TOTAL G2		25,756	$5,716,232	$221.94
T2	617	$4,463	46	$205,298	
	627	$4,463	5	$22,315	
	677	$4,463	17	$75,871	
	707	$4,463	17	$75,871	
	717	$4,463	13	$58,019	
	777	$4,463	1	$4,463	
	907	$2,382	56	$133,392	
	917	$2,550	1,144	$2,917,200	
	977	$2,550	147	$374,850	
	SUBTOTAL T2		1,446	$3,867,279	$2,674.47
	TOTAL RATE G2/T2		27,202	$9,583,511	$352.31
G3	407	$4,437	4	$17,748	
	417	$4,437	274	$1,215,738	
	477	$4,437	178	$789,786	
	507	$24,705	1	$24,705	
	TOTAL RATE G3		457	$2,047,977	$4,481.35
	TOTAL GENERAL SERVICE		83,538	$15,989,128	$191.40
S2	055	$55	2,756	$151,580	
	TOTAL S2		2,756	$151,580	$55.00
	TOTAL ELECTRIC		645,843	$48,025,023	$74.36

NOTE: RETAIL COST OF SERVICE STUDY FOR THE YEAR ENDING 12/31/91.

CUSTOMER RELATED OPERATION AND MAINTENANCE EXPENSE

YEAR	(1) METER O&M EXPENSE (NOTE 1)	(2) STREET LIGHT O&M (NOTE 2)	(3) CUSTOMER INSTALL O&M (NOTE 3)	(4) AVG. # OF CUSTOMERS W/O ST.LTG. (NOTE 4)	(5) NUMBER STREET LAMPS (NOTE 5)	(6) EXPENSE PER CUSTOMER METERS (1)/(4)	(7) INSTAL-LATION (3)/(4)	(8) EXPENSE PER LAMP (2)/(5)
1982	$5,560,463	$2,469,570	$5,424,877	613,233	114,678	$9.07	$8.85	$21.53
1983	$6,422,307	$3,020,153	$5,149,781	621,003	114,606	$10.34	$8.29	$26.35
1984	$5,985,395	$3,179,751	$5,602,914	629,973	114,429	$9.50	$8.89	$27.79
1985	$7,480,202	$2,651,719	$6,018,049	635,561	114,172	$11.77	$9.47	$23.23
1986	$6,680,422	$2,256,620	$5,765,460	635,428	114,205	$10.51	$9.07	$19.76
1987	$8,746,895	$3,274,484	$6,950,474	629,156	114,216	$13.90	$11.05	$28.67
1988	$7,661,006	$3,390,089	$7,329,859	637,752	114,582	$12.01	$11.49	$29.59
1989	$8,930,545	$3,348,952	$7,354,690	646,186	114,623	$13.82	$11.38	$29.22
1990	$7,199,099	$3,501,488	$7,423,888	650,323	113,252	$11.07	$11.42	$30.92
1991	$7,247,002	$3,299,894	$8,201,272	651,174	113,095	$11.13	$12.59	$29.18
			AVERAGE EXPENSE IN 1991 DOLLARS			$11.31	$10.25	$26.62
			AVERAGE EXPENSE IN 1992 DOLLARS (NOTE 6)			$11.90	$10.78	$28.00

NOTE 1) FERC ACCOUNTS 586,597 AND PORTIONS OF 580,581,588 AND 590. SEE MCWS-404
2) FERC ACCOUNTS 585,596 AND PORTIONS OF 580,581,588 AND 590. SEE MCWS-405
3) FERC ACCOUNT 587 AND PORTIONS OF 580,581,588 AND 590. SEE MCWS-407
4) MCWS-708
5) MCWS-708
6) DRI UTILITY COST FORECASTING INDEX FOR WAGE RATE-MCWS 1040.
ESCALATOR = 1.052

CUSTOMER ACCOUNTS EXPENSE FOR EACH RATE
ACCOUNTS 901-904

RATE	(1) 1991 $ (NOTE 1)	(2) 1992 $ (NOTE 2)	(3) AVG YR END # OF CUSTOMER (NOTE 3)	(4) METERING EXPENSE ALLOCATED BY COL.(2) (NOTE 4)	(5) $ PER CUSTOMER (4)/(3)	(6) RECORDS EXPENSE ALLOCATED BY COL.(2) (NOTE 5)	(7) $ PER CUSTOMER (6)/(3)	TOTAL CUSTOMER ACCOUNTS EXPENSE (5)+(7)
R1/R2/R4	$27,948,000	$29,401,296	559,549	$5,591,768	$9.99	$11,466,839	$20.49	$30.48
G1/018/078	$597,000	$628,044	6,959	$119,446	$17.16	$244,944	$35.20	$52.36
G1/OTHER/T1	$2,459,000	$2,586,868	48,920	$491,991	$10.06	$1,008,908	$20.62	$30.68
G2	$3,679,000	$3,870,308	27,202	$736,085	$27.06	$1,509,464	$55.49	$82.55
T2	$2,413,000	$2,538,476	459	$482,787	$1,051.82	$990,034	$2,156.94	$3,208.76
G3	$1,882,000	$1,979,864	459	$376,546	$820.36	$772,169	$1,682.29	$2,502.65
S2	$175,000	$184,100	2,756	$35,014	$12.70	$71,801	$26.05	$38.75
OTHER LIGHT	$231,000	$243,012	8,169	$46,218	$5.66	$94,777	$11.60	$17.26
TOTAL	$39,384,000	$41,431,968	654,473	$7,879,855		$16,158,938		

NOTE (1) EXPENSE FROM THE RETAIL COST OF SERVICE WORKPAPERS FOR THE YEAR ENDING 12/31/91
(2) DRI UTILITY COST FORECASTING INDEX FOR WAGE RATE-MCWS 1040.
ESCALATOR = 1.052
(3) ANNUAL CUSTOMER COUNT WORKSHEETS
(4) COLUMN 4 TOTAL = COLUMN 3 TOTAL * ADDITIONAL METERING EXPENSE OF $12.04 (SEE MCWS-705)
METERING EXPENSE BY RATE IS BASED ON THE ALLOCATION IN COLUMN 2
(5) COLUMN 6 TOTAL = COLUMN 3 TOTAL * RECORDS EXPENSE OF $24.69 (SEE MCWS-705)
RECORDS EXPENSE BY RATE IS BASED ON THE ALLOCATION IN COLUMN 2

CUSTOMER ACCOUNTS EXPENSE PER CUSTOMER
ACCOUNTS 901-904

	1987	1988	1989	1990	1991
(1) 901 -- SUPERVISION (NOTE 1)	$1,525,562	$1,478,764	$1,657,345	$1,661,635	$1,707,939
(2) 902 -- METERING EXPENSE (NOTE 1)	$6,135,970	$6,467,601	$6,596,984	$7,074,668	$6,468,908
(3) 903 -- CUSTOMER RECORDS (NOTE 1)	$12,210,142	$12,569,299	$13,303,626	$14,536,754	$15,024,403
(4) METERING W/ SUPERVISION (NOTE 2A)	$6,646,204	$6,969,997	$7,146,388	$7,618,617	$6,982,952
(5) RECORDS W/ SUPERVISION (NOTE 2B)	$13,225,470	$13,545,667	$14,411,567	$15,654,440	$16,218,298
(6) TOTAL NUMBER OF CUSTOMERS (NOTE 3)	631,714	640,360	648,864	653,091	654,014
(7) RESIDENTIAL,COMMERCIAL,& INDUSTRIAL (NOTE 3)	629,158	637,752	646,186	650,323	651,174
(8) LABOR COST INDEX (NOTE 4)	0.921	0.962	1.006	1.056	1.102
(9) 1991 INDEX / EACH YEAR'S INDEX	1.197	1.146	1.095	1.044	1.000
(10) METER EXP PER CUSTOMER (1991 $) [Line(4) / Line(7)] * Line(9)	$12.64	$12.52	$12.11	$12.23	$10.72
(11) RECORDS EXP PER CUSTOMER (1991 $) [Line(5) / Line(6)] * Line(9)	$25.06	$24.24	$24.32	$25.02	$24.80
(12) RECORDS EXPENSE PER CUSTOMER (AVERAGE 1987-1991)					$24.69
(13) ADDITIONAL METERING EXPENSE (AVERAGE 1987-1991)					$12.04

NOTE 1. FERC FORM 1, PAGE 322
2A [[Line(2) / [Lines(2)+(3)]] * Line(1)] + Line(2)
2B [[Line(3) / [Lines(2)+(3)]] * Line(1)] + Line(3)
3. MCWS-708
4. DRI EMPLOYMENT COST INDEX-COMPENSATION, PRIVATE INDUSTRY WORKERS-MCWS 1040.

CUSTOMER SERVICE & INFORMATION EXPENSE FOR EACH RATE
ACCOUNTS 907-910

RATE	(1) 1991 $ (NOTE 1)	(2) 1992 $ (NOTE 2)	(3) AVG YR END # OF CUSTOMERS (NOTE 3)	(4) ALLOCATED BY COL.(2) (NOTE 5)	(5) $ PER CUSTOMER (4)/(3)
R1/R2/R4	$1,549	$1,630	559,549	$2,426,843	$4.34
G1/018/078	$41	$43	6,959	$64,021	$9.20
G1/OTHER/T1	$170	$179	48,920	$266,506	$5.45
G2	$464	$488	27,202	$726,564	$26.71
T2	$425	$447	27,202	$665,521	$24.47
G3	$428	$450	459	$669,987	$1,459.67
S2	$11	$12	2,756	$17,866	$6.48
OTHER LIGHT	$26	$27	8,169	$40,199	$4.92
TOTAL	$3,114	$3,276	681,216 * $7.16 = (NOTE 4)	$4,877,507	

NOTE (1) EXPENSE FROM THE RETAIL COST OF SERVICE WORKPAPERS FOR THE YEAR ENDING 12/31/91
(2) DRI UTILITY COST FORECASTING INDEX FOR WAGE RATE-MCWS 1040.
ESCALATOR = 1.052 * COLUMN (1)
(3) ANNUAL CUSTOMER COUNT WORKSHEETS
(4) AVERAGE EXPENSE PER CUSTOMER (MCWS-707) 7.16 * TOTAL COLUMN (3)
(5) TOTAL EXPENSE IS ALLOCATED BASED ON EMBEDDED EXPENSE IN COLUMN 2

CUSTOMER SERVICE & INFORMATION EXPENSE PER CUSTOMER
ACCOUNTS 907-910

	1987	1988	1989	1990	1991
(1) CUSTOMER SERVICE & INFO. EXPENSES (NOTE 1)	$2,998,571	$3,171,403	$5,867,254	$6,110,690	$3,114,269
(2) NUMBER OF CUSTOMERS (NOTE 2)	631,714	640,360	648,864	653,091	654,014
(3) LABOR COST INDEX (NOTE 3)	0.921	0.962	1.006	1.056	1.102
(4) 1991 INDEX / EACH YEAR'S INDEX	1.197	1.146	1.095	1.044	1.000
(5) EXPENSE PER CUSTOMER (1991 $) [Line(1) / Line(2)] * Line(4)	$5.68	$5.68	$9.90	$9.77	$4.76
(6) ESTIMATED EXPENSE (AVERAGE 1987-1991)					$7.16

NOTE 1) ACCOUNTS 907 THRU 910 IN FERC FORM 1, PAGE 322.
2) MCWS-708.
3) DRI EMPLOYMENT COST INDEX-COMPENSATION, PRIVATE INDUSTRY WORKERS-MCWS 1040.

AVERAGE NUMBER OF CUSTOMERS PER YEAR

YEAR	RESIDENT (NOTE 1)	COMMERCIAL/ INDUSTRIAL (NOTE 2)	TOTAL	CHANGE	STREET LIGHTING (NOTE 3)	TOTAL	NUMBER OF LAMPS (NOTE 4)	CHANGE
1981	529,470	77,603	607,073		2,299	609,372	114,714	
1982	535,357	77,876	613,233	6,160	2,434	615,667	114,678	(36)
1983	541,676	79,327	621,003	7,770	2,414	623,417	114,606	(72)
1984	548,169	81,804	629,973	8,970	2,445	632,418	114,429	(177)
1985	552,210	83,351	635,561	5,588	2,498	638,059	114,172	(257)
1986	550,125	85,303	635,428	(133)	2,505	637,933	114,205	33
1987	541,160	87,996	629,156	(6,272)	2,558	631,714	114,216	11
1988	548,065	89,687	637,752	8,596	2,608	640,360	114,582	366
1989	555,073	91,113	646,186	8,434	2,678	648,864	114,623	41
1990	558,501	91,822	650,323	4,137	2,768	653,091	113,252	(1,371)
1991	559,400	91,774	651,174	851	2,840	654,014	113,095	(157)

NOTES 1) FERC FORM 1, PAGE 304, ACCOUNT 440.

2) FERC FORM 1, PAGE 304, ACCOUNT 442.

3) FERC FORM 1, PAGE 304, ACCOUNT 444.

4) MASSACHUSETTS SUPPLEMENT TO FERC FORM 1, PAGE S15.

DERIVATION OF PVRR

	IOWA CURVE	AVERAGE SERVICE LIFE	PV RELATED TO REVENUE REQUIREMENT
GENERATION	SQ	25	$1,351.66
TRANSMISSION	R3.0	35	$1,341.33
DISTRIBUTION			
FERC Account 361	R3.0	50	$1,336.01
FERC Account 362	R4.0	30	$1,346.41
FERC Account 364	R3.0	27	$1,343.86
FERC Account 365	R1.0	25	$1,317.70
FERC Account 366	R4.0	60	$1,334.72
FERC Account 367	R3.0	35	$1,341.33
FERC Account 368	L3.0	30	$1,343.72
METERS (FERC Account 370)	R2.0	30	$1,334.26
SERVICES (FERC Account 369)	S0.5	35	$1,335.68
STREET LIGHTING (FERC Account 373)	S0.0	20	$1,333.92

NOTE: SEE MCWS-921 for an example of how the PV related to revenue requirement was derived.

ECONOMIC CARRYING CHARGE: GENERATION ACCOUNT
IOWA: SQ
SERVICE LIFE: 25
PRESENT VALUE OF REVENUE REQUIREMENT
RELATED TO INCREMENTAL $1,000 INVEST. = $1,351.66

ASSUMPTIONS

Type of Plant		
Book Life	25.00	Years
Iowa Curve	SQ	
Modified ACRS Life	20.00	Years
ITC Rate	0.00	
Income Tax Rate	38.29	Percent See MCWS-922
Property Tax	1.65	Percent See MCWS-923
Tax Basis	100.00	Percent (Proportion of investment that is tax depreciable excluding the basis reduction if 10% ITC is used.)

Composite Incremental Cost of Capital (Discount Rate)

Debt	45.00	@ 9.25	=	4.16 Percent
Preferred Stock	10.00	@ 8.75	=	0.88 Percent
Common Equity	45.00	@ 13.00	=	5.85 Percent
Total				10.89 Percent

Total return and calculations reflect:
The flow-through of the difference between book and straight line depreciations.
The normalization of the difference between straight line and ACRS depreciations.
The service life flow-through of the investment tax credit.

Inflation 4.40 Percent (Inflation net of technical progress)
Source: DRI Implicit Price Deflator for Private Non-Residential Construction. See MCWS-1040.

CALCULATION OF PLANT LIFETIME REVENUE REQUIREMENTS

Year	Mean Annual Survivors	Book Depreciation	Retirements	Book Depreciation Reserve	Mean Net Book Investment	Straight-Line Depreciation	Modified ACRS Depreciation	Deferred Income Tax	Deferred Tax Reserve	Investment Tax Credit Deferred Credit	Investment Tax Credit Amortization	Investment Tax Credit Reserve
		4.00% x (1)		Sum of (2)-(3)#	(1)-(4)	4.00% x 1000 x 100.00% x 1.00		38.29% x [(7) - (6)]	Sum of (8)#	0.00% x 1000 x 100.00%	ITC x 4.00%	Sum of (10)-(11)#
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.00	1000	40.00	0.00	0.00	1000.00	40.00	37.50	-0.96	0.00	0.00	0.00	0.00
2.00	1000	40.00	0.00	40.00	960.00	40.00	72.19	12.33	-0.96	0.00	0.00	0.00
3.00	1000	40.00	0.00	80.00	920.00	40.00	66.77	10.25	11.37	0.00	0.00	0.00
4.00	1000	40.00	0.00	120.00	880.00	40.00	61.77	8.34	21.62	0.00	0.00	0.00
5.00	1000	40.00	0.00	160.00	840.00	40.00	57.13	6.56	29.95	0.00	0.00	0.00
6.00	1000	40.00	0.00	200.00	800.00	40.00	52.85	4.92	36.51	0.00	0.00	0.00
7.00	1000	40.00	0.00	240.00	760.00	40.00	48.88	3.40	41.43	0.00	0.00	0.00
8.00	1000	40.00	0.00	280.00	720.00	40.00	45.22	2.00	44.83	0.00	0.00	0.00
9.00	1000	40.00	0.00	320.00	680.00	40.00	44.62	1.77	46.83	0.00	0.00	0.00
10.00	1000	40.00	0.00	360.00	640.00	40.00	44.62	1.77	48.60	0.00	0.00	0.00
11.00	1000	40.00	0.00	400.00	600.00	40.00	44.62	1.77	50.37	0.00	0.00	0.00
12.00	1000	40.00	0.00	440.00	560.00	40.00	44.62	1.77	52.13	0.00	0.00	0.00
13.00	1000	40.00	0.00	480.00	520.00	40.00	44.62	1.77	53.90	0.00	0.00	0.00
14.00	1000	40.00	0.00	520.00	480.00	40.00	44.62	1.77	55.67	0.00	0.00	0.00
15.00	1000	40.00	0.00	560.00	440.00	40.00	44.62	1.77	57.44	0.00	0.00	0.00
16.00	1000	40.00	0.00	600.00	400.00	40.00	44.62	1.77	59.20	0.00	0.00	0.00
17.00	1000	40.00	0.00	640.00	360.00	40.00	44.62	1.77	60.97	0.00	0.00	0.00
18.00	1000	40.00	0.00	680.00	320.00	40.00	44.62	1.77	62.74	0.00	0.00	0.00
19.00	1000	40.00	0.00	720.00	280.00	40.00	44.62	1.77	64.50	0.00	0.00	0.00
20.00	1000	40.00	0.00	760.00	240.00	40.00	44.62	1.77	66.27	0.00	0.00	0.00
21.00	1000	40.00	0.00	800.00	200.00	40.00	22.31	-6.77	68.04	0.00	0.00	0.00
22.00	1000	40.00	0.00	840.00	160.00	40.00	0.00	-15.32	61.26	0.00	0.00	0.00
23.00	1000	40.00	0.00	880.00	120.00	40.00	0.00	-15.32	45.95	0.00	0.00	0.00
24.00	1000	40.00	0.00	920.00	80.00	40.00	0.00	-15.32	30.63	0.00	0.00	0.00
25.00	1000	40.00	1000.00	960.00	40.00	40.00	0.00	-15.32	15.32	0.00	0.00	0.00

INCOME TAX FACTOR

1. TAXABLE INCOME	100.00%
2. LESS: STATE CORPORATE FRANCHISE TAX	6.50%
3. TAXABLE INCOME AFTER CORPORATE FRANCHISE TAX (LINE 1 - LINE 2)	93.50%
4. FEDERAL CORPORATE INCOME TAX (LINE 3 * 34 %)	31.79%
5. STATE & FEDERAL TAXES (LINE 2 + LINE 4)	38.29%

PROPERTY TAX FACTORS

	(A) ELECTRIC PLANT IN SERVICE $000 (NOTE 1)	(B) PROPERTY TAXES $000		(C) PERCENT
PRODUCTION EXCLUDING NUCLEAR & WYMAN #4	$720,745	$11,902		1.65%
TRANSMISSION	$376,379	$6,215		1.65%
DISTRIBUTION	$1,176,599	$19,429		1.65%
GENERAL	$106,190	$1,754		1.65%
SUBTOTAL	$2,379,913	$39,299		1.65%
NUCLEAR	$1,054,361	$11,520		1.09%
WYMAN #4	$12,118	$218		1.80%
INTANGIBLE	$56,816	$0		0.00%
	$3,503,208	$51,037	(NOTE 2)	1.46%

NOTES: (1) FERC FORM 1, PAGES 204 – 207
(2) TOTAL PROPERTY TAXES – FERC FORM 1, PAGES 262 – 263

DERIVATION OF THE PRESENT VALUE OF REVENUE REQUIREMENT FOR DISTRIBUTION

FERC ACCOUNT NUMBERS	TOTAL PLANT 1991 $ (NOTE 1)
361	$33,528,213
362	$167,145,026
364	$50,544,504
365	$147,261,028
368	$168,059,263
	$566,538,034

HIGH TENSION ACCOUNTS (NOTE 2)	TOTAL PLANT 1991 $	WEIGHT (NOTE 3)	PVRR (NOTE 4)	PVRR FOR HIGH TENSION (NOTE 5)
361	$33,528,213	0.1282	$1,336.01	$171.28
362	$167,145,026	0.6392	$1,346.41	$860.63
0.1431 * ACCOUNT 364	$7,232,919	0.0277	$1,343.86	$37.22
0.3391 * ACCOUNT 365	$49,936,215	0.1910	$1,317.70	$251.68
0.0216 * ACCOUNT 368	$3,630,080	0.0139	$1,343.72	$18.68
TOTAL	$261,472,453	1.0000		$1,339.49

SECONDARY ACCOUNTS (NOTE 2)	TOTAL PLANT 1991 $	WEIGHT (NOTE 3)	PVRR (NOTE 4)	PVRR FOR SECONDARY (NOTE 5)
0.8569 * ACCOUNT 364	$43,311,585	0.1420	$1,343.86	$190.83
0.6609 * ACCOUNT 365	$97,324,813	0.3190	$1,317.70	$420.35
0.9784 * ACCOUNT 368	$164,429,183	0.5390	$1,343.72	$724.27
TOTAL	$305,065,581	1.0000		$1,335.45

PV REVENUE REQUIREMENT = $1,337.31

NOTES: (1) FERC FORM 1 PAGES 206 – 207.
(2) PERCENTAGE SPLITS BETWEEN HIGH TENSION & SECONDARY ARE FOUND ON MCWS-306.
(3) ACCOUNT / TOTAL
(4) MCWS-920
(5) PVRR * WEIGHT

DERIVATION OF SERVICE LIFE FOR HIGH TENSION & SECONDARY DISTRIBUTION

FERC ACCOUNT NUMBERS	TOTAL PLANT 1991 $ (NOTE 1)
361	$33,528,213
362	$167,145,026
364	$50,544,504
365	$147,261,028
368	$168,059,263
	$566,538,034

HIGH TENSION ACCOUNTS (NOTE 2)	TOTAL PLANT 1991 $	WEIGHT (NOTE 3)	SERVICE LIFE (NOTE 4)	AVERAGE SERVICE LIFE (NOTE 5)
361	$33,528,213	0.1282	50	6
362	$167,145,026	0.6392	30	19
0.1431 * ACCOUNT 364	$7,232,919	0.0277	27	1
0.3391 * ACCOUNT 365	$49,936,215	0.1910	25	5
0.0216 * ACCOUNT 368	$3,630,080	0.0139	30	0
TOTAL	$261,472,453	1.0000		31

SECONDARY ACCOUNTS (NOTE 2)	TOTAL PLANT 1991 $	WEIGHT (NOTE 3)	SERVICE LIFE (NOTE 4)	AVERAGE SERVICE LIFE (NOTE 5)
0.8569 * ACCOUNT 364	$43,311,585	0.1420	27	4
0.6609 * ACCOUNT 365	$97,324,813	0.3190	25	8
0.9784 * ACCOUNT 368	$164,429,183	0.5390	30	16
TOTAL	$305,065,581	1.0000		28

SERVICE LIFE = 29

NOTES: (1) FERC FORM 1 PAGES 206-7.
(2) PERCENTAGE SPLITS BETWEEN HIGH TENSION & SECONDARY ARE FOUND ON MCWS-306.
(3) ACCOUNT / TOTAL
(4) MCWS-920
(5) SERVICE LIFE * WEIGHT

OFFICE MEMORANDUM

MCWS-940

Boston Edison Company

TO: Distribution

FROM: J. R. Mitiguy
Mail: P-356

DATE: February 11, 1992
Phone: 2336

RE: MARGINAL COST OF CAPITAL

Distribution:

J. J. Judge	F. W. Hoey	A. L. Cotellessa
R. D. Saunders	P. Didomenico	W. P. Killgoar
J. Baumhauer	E. V. Saunders	

The purpose of this memo is to provide an updated marginal cost of capital which should be used for initial in-house screening of capital investments and for rate setting. Individual major capital investment projects may require a review of this cost of capital by the Financial Management Department as special financing considerations may be applicable.

Marginal Cost of Capital

	Component Mix	Cost	Weighted Cost
Debt	45%	9.25	4.1625%
Preferred	10	8.75	0.8750
Common	45	13.00	5.8500
Total	100%	-	10.8875%

Boston Edison Company

Marginal Cost of Service Study

Technical Summary

Econometric Discount Allocation Method

According to the modified peaker method, the cost of marginal capacity is defined as the cost of a peaker discounted from the year that capacity is needed. This can be written as:

$$MC = K * [\ 1/(1+r)\ ]^{(c-y)}$$

where: K = cost of a peaker per kilowatt in the year capacity is needed

r = discount rate

c = year that capacity is needed

y = study year

Since the cost of a peaker, K, is stated in constant dollars in the year capacity is needed, the cost i years earlier, given the same load forecast, would have been:

$$MC = K * [\ 1/(1+r)\ ]^{(c-y-i)}$$

If we can find values j and k such that the peak load in the winter in year y is equal to the summer peak load in year y-j

and the peak load in the off-season in year y is equal to the summer peak load in year y-k, then we can equate the summer portion of the annual cost with the winter portion in year y-j and the off-season in year y-k. In the other words, the demand payment in constant dollars is tied to the peak load level in a given season. This can be written as:

$$w * K * [1/(1+r)]^{(c-y-j)} = o * K * [1/(1+r)]^{(c-y-k)} = s * K * [1/(1+r)]^{(c-y)}$$

$$s+w+o = 1, \text{ and } 0 < s,w,o < 1$$

where s, w, and o are the seasonal allocators of annual production demand for summer (June through September), winter (December through March), and the off-season (April, May, October, November). Solving for s, w, and o will give the seasonal allocation factors. Notice that the cost of the peaker and the year that capacity is needed cancel out. Thus, the above equation simplifies to:

$$w * [1/(1+r)]^{(-j)} = o * [1/(1+r)]^{(-k)} = s$$

In order to estimate j and k, historical data was used for the study horizon of 1982 to 1991 . Summer, winter and off-season peaks were regressed against time, yielding a good fit. The value for j was found by solving for the winter peak in 1991, the study year, and finding the year when the summer equation, adjusted for the 172.42 mW summer capacity derating, had that value.

The regression results using an 10.89% discount rate are as follows:

Summer r-square	0.7469
slope	52.30
intercept + 172.42	-101262
Winter r-square	0.8055
slope	52.17
intercept	-101442
Spr/Fall r-square	0.8883
slope	56.39
intercept	-109981
Winter eval at 1991	2428.47
Solve for year(summer)	1982.61
Winter lag years	8.4
Spr/Fall eval at 1991	2291.49
Solve for year(summer)	1979.99
Off season lag years	11.0
Summer allocation	57.45%
Winter allocation	24.14%
Off-season allocation	18.41%

Average Summer Peak

	Generation	Transmission
1986	54%	54%
1987	N/A	N/A
1988	55%	55%
1989	50%	50%
1990	54%	54%
1991	57%	57%
Average	54%	54%

Summer Allocation

Econometric Discount Allocation Method
Input Section

	Winter	Sp/Fall	Summer	Total
Weight $[1/(1+r)^{-j}]$	0.420073	0.320439	1	1.740512
Normalized	0.24135	0.184106	0.574543	1

ANNUAL SEASONAL LOAD

YEAR	SUMMER	WINTER	SPR/FALL
1982	2181	1910	1760
1983	2233	2013	1787
1984	2387	1992	1916
1985	2416	2143	1951
1986	2254	2193	2089
1987	2614	2244	2151
1988	2626	2418	2175
1989	2626	2399	2227
1990	2548	2283	2131
1991	2652	2333	2272

REGRESSION ANALYSIS

SUMMER Regression Output:		
Constant		-101434
Std Err of Y Est		97.77194
R Squared		0.746864
No. of Observations		10
Degrees of Freedom		8
X Coefficient(s)	52.29697	
Std Err of Coef.	10.76434	
WINTER Regression Output:		
Constant		-101442
Std Err of Y Est		82.32043
R Squared		0.805514
No. of Observations		10
Degrees of Freedom		8
X Coefficient(s)	52.1697	
Std Err of Coef.	9.063181	
SPR/FALL Regression Output:		
Constant		-109981
Std Err of Y Est		64.2321
R Squared		0.888258
No. of Observations		10
Degrees of Freedom		8
X Coefficient(s)	56.39394	
Std Err of Coef.	7.071721	

DISTALL

ALLOCATION OF MARGINAL DISTRIBUTION DEMAND

TEST YEAR ENDED DECEMBER 1991 DATA

	Summer	Winter
1 Distribution Capacity	3,018,400	3,362,200
2 Distribution Loading	1,847,700	1,675,700
3 Difference	1,170,700	1,686,500
4 1/Difference	0.00000085	0.00000059
5 Ratio of Season to Summer (Line 4/Summer-Line 4)	1.00000	0.69416
6 Number of Months	4	8
7 Allocation to Season (Line 5 * Line 6)	4.00000	5.55328
8 Sum of Columns Line 7	9.55328	9.55328
9 Normalized to 100% (Line 7/Line 8)	41.87%	58.13%
10 Rounded for Study	42%	58%
11 Percentage to Each Month (Line 9/Line 6)	10.47%	7.27%

Note: The Summer/Winter allocation is proportional to the inverse of the difference between the capacity and the load. Line 5 shows that the allocation to a winter month should be 69% of the allocation to a summer month. This ratio is further weighted by the number of months in the season in Line 7, and normalized to 100% in Line 9.

ATTACHMENT 10B

BOSTON EDISON COMPANY
1991 SYSTEM LOSS STUDY
SEASONAL ON/OFF PEAK LOSS FACTORS & PERCENT MARGINAL LOSSES

		TRANSMISSION	HIGH TENSION	PRIMARY	SECONDARY	SYSTEM
SUMMER						
LOSS FACTORS	ON PEAK	0.9826	0.9530	0.9392	0.9084	0.9247
	OFF PEAK	0.9830	0.9598	0.9525	0.9200	0.9354
	NCP	0.9788	0.9469	0.9289	0.8930	
	CP	0.9793	0.9481	0.9299	0.8936	0.9126
PERCENT MARGINAL LOSSES						
	ON PEAK	3.23	9.01	12.03	18.02	
	OFF PEAK	3.00	7.23	8.54	14.20	
	NCP	4.17	10.51	14.61	22.36	
	CP	4.05	10.22	14.35	22.20	
WINTER						
LOSS FACTORS	ON PEAK	0.9764	0.9545	0.9418	0.9112	0.9297
	OFF PEAK	0.9786	0.9606	0.9530	0.9200	0.9384
	NCP	0.9702	0.9503	0.9345	0.9022	
	CP	0.9705	0.9532	0.9388	0.9028	0.9236
PERCENT MARGINAL LOSSES						
	ON PEAK	4.71	8.64	11.39	17.25	
	OFF PEAK	4.20	7.01	8.42	14.27	
	NCP	6.12	9.69	13.23	19.82	
	CP	6.05	8.95	12.16	19.63	

EMPLOYMENT COST INDEX - COMPENSATION, PRIVATE INDUSTRY WORKERS (ECI) (ECIWSSP)

YEAR	INDEX	GROWTH RATE
1980	0.630	
1981	0.694	10.1%
1982	0.743	7.1%
1983	0.787	6.0%
1984	0.827	5.1%
1985	0.863	4.4%
1986	0.893	3.4%
1987	0.921	3.1%
1988	0.962	4.4%
1989	1.006	4.7%
1990	1.056	4.9%
1991	1.102	4.4%
CAG		5.2%

DRI : REVIEW OF THE U.S. ECONOMY.

Wage Rate for Electric, Gas and Sanitary Services($/Hour)

Year	Index	Growth Rate
1990	15.24	
1991	15.88	4.2%
1992	16.70	5.2%
1993	17.46	4.6%
1994	18.20	4.2%
1995	18.98	4.3%
1996	19.77	4.2%
1997	20.65	4.5%
1998	21.61	4.6%
1999	22.61	4.6%
2000	23.69	4.8%
2001	24.82	4.8%
2002	25.94	4.5%
2003	27.10	4.5%
2004	28.32	4.5%
2005	29.60	4.5%
2006	30.93	4.5%
2007	32.32	4.5%
2008	33.78	4.5%
2009	35.30	4.5%
2010	36.88	4.5%
2011	38.54	4.5%
2012	40.28	4.5%
2013	42.09	4.5%
2014	43.99	4.5%
2015	45.97	4.5%
2016	48.03	4.5%
2017	50.20	4.5%
2018	52.45	4.5%
2019	54.81	4.5%
2020	57.28	4.5%
CAG 1991-2020		4.5%

Source : DRI Cost and Price Review Third Quarter 1991

GROSS NATIONAL PRODUCT- IMPLICIT PRICE DEFLATOR

1982=1.000

YEAR	PGNP	% CHANGE
1990	1.315	
1991	1.364	3.8%
1992	1.402	2.8%
1993	1.440	2.7%
1994	1.482	2.9%
1995	1.527	3.0%
1996	1.578	3.4%
1997	1.634	3.5%
1998	1.690	3.5%
1999	1.751	3.6%
2000	1.819	3.9%
2001	1.892	4.0%
2002	1.970	4.1%
2003	2.050	4.1%
2004	2.135	4.1%
2005	2.222	4.1%
2006	2.315	4.2%
2007	2.413	4.2%
2008	2.518	4.3%
2009	2.630	4.4%
2010	2.745	4.4%
2011	2.865	4.4%
2012	2.993	4.5%
2013	3.131	4.6%
2014	3.281	4.8%
2015	3.438	4.8%
2016	3.603	4.8%
2017	3.776	4.8%
2018	3.958	4.8%
2019	4.148	4.8%
2020	4.347	4.8%
CAG		
1990-2015		**4.1%**

Source: DRI Review of the U.S. Economy Trend 0891

Gross National Product- Implicit Price Deflator -
Private Non- Residential Construction (1982=1.000)

Year	Index	growth rate
1990	1.216	
1991	1.238	1.8%
1992	1.261	1.9%
1993	1.293	2.5%
1994	1.347	4.2%
1995	1.390	3.2%
1996	1.455	4.6%
1997	1.521	4.5%
1998	1.579	3.8%
1999	1.644	4.1%
2000	1.717	4.4%
2001	1.795	4.5%
2002	1.879	4.7%
2003	1.963	4.5%
2004	2.048	4.3%
2005	2.138	4.4%
2006	2.232	4.4%
2007	2.332	4.5%
2008	2.441	4.7%
2009	2.559	4.8%
2010	2.683	4.9%
2011	2.810	4.7%
2012	2.946	4.8%
2013	3.092	4.9%
2014	3.245	5.0%
2015	3.408	5.0%
2016	3.561	5.1%
2017	3.763	5.1%
2018	3.955	5.1%
2019	4.157	5.1%
2020	4.369	5.1%
1990-2020		4.4%

Source:DRI Review of the U.S. Economy trend25yr0891